	Cases (monthly)		Controls (monthly)	*P*-value
	Pre-AlloSCT {A} (n=26, mean (SD)	Post-AlloSCT {B} (n=20, mean(SD)	Controls {C} n=47, mean (SD)	
Inpatient visit	0.10 (0.15)	0.03 (0.10)	0.13 (0.13)	A vs. B 0.306 B vs. C 0.0003
Inpatient Cost($)	4713.2 (10895.2)	2433.3 (9970.4)	2307.3 (5825.4)	A vs. B 0.303 B vs. C 0.958
Outpatients visits	3.84 (4.33)	1.08 (1.05)	0.26 (0.29)	A vs. B <0.0001 B vs. C <0.0001
Outpatient Cost ($)	3045.8 (4222.4)	9514.9 (32163.8)	5577.7 (15392.4)	A vs. B 0.295 B vs. C 0.606

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Incidence and Mortality of Adenovirus Infection After Pediatric Allogeneic SCT – A Comparison Between Bone Marrow and CD3/19 Depleted PBSC

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Infection with human adenoviruses (ADV) can cause life-threatening infections in pts after allo-SCT and represents a major reason for transplant related mortality (TRM, in historical cohorts after haplo- SCT up to 30%). Graft manipulation by T-cell depletion affect immune reconstitution and can extend duration of impairment of immunity after SCT. Delayed reconstitution of immunity increases the risk for viral infections. New preparative regimens such as reduced intensity conditioning (RIC) followed by CD3/19 depleted PBSC transplant (3/19depl-PBSCT) try to overcome these limitations. To substantiate this we studied the incidence (inc.) and mortality of ADV infection after ped. allo-SCT overall and as a function of graft. 210 transplants have been performed in 200 ped. pts in Frankfurt between '05 and '11. Donor source was 3/19depl-PBSC (n=95) and BM (n=115). Median follow up was 13.9 mths. Weekly post-transpl. ADV-screening was conducted by qPCR in plasma, throats swabs and faeces. Inc. of ADV detection in any compartment at any time-point was 40.0% and sign. higher after 3/19depl-PBSCT compared to BMT; 49.5% vs 32.2% ($P = .016$). Inc. was 26.7% <=d60, 20.6% d61 to 100 and 14.0% >d100. Cumulative inc. of 3y TRM (CI 3y TRM) due to ADV disease was 4.6% (3/19depl-PBSCT 6.9%, BMT 3.0%; n. sign.). In detail, 14.5% of pts (29/200) died due to non relapse mortality. Amongst these 29 pts, 16 (55.2%) were ADV pos.. ADV positivity was sign. more frequent after 3/19depl-PBSCT compared to BMT (84.6% vs 31.3%; $P = .008$). Mortality due to ADV disease among TRM pts was 27.6% (3/19depl- PBSCT 38.5%, BMT 18.8%; n. sign.). Overall CI 3y TRM was sign. higher in ADV pos. (n=84) vs neg. (n=126) pts (28.7% vs 13.4%, $P = .03$). Taken together, ADV was detected in every second pt after 3/19depl-PBSCT. Although the CI 3y TRM due to ADV disease was low (4.6%), post-transpl. ADV detection sign. increased the risk for subsequent TRM. In summary, ADV represents a severe threat to survival, particularly in pts after 3/19depl-PBSCT. Apparently, more rapid reconstitution of immunity in these pts compared to historical mega-dose CD34 transplants resulted in low mortality due to ADV disease in this high-risk group.

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Single Institution Experience With Allogeneic Hematopoietic Stem Cell Transplantation for Pediatric and AYA Patients With Acute Leukemia

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Objective: The goal of this retrospective study was to analyze the clinical outcomes of a large cohort of pediatric and adolescent/young adult (AYA) patients with high-risk acute leukemia (AL) who underwent allogeneic hematopoietic stem cell transplantation (HSCT) with a uniform preparative regimen at Stanford University over the past decade.
Patients and Methods: Data was analyzed for 152 pediatric and AYA patients between the ages of 0-21 years who received HSCT for acute leukemia at Stanford University since 2001. This cohort included patients with acute lymphoblastic leukemia (ALL, n=86), acute myelogenous leukemia (AML; n=61), and biphenotypic leukemia (n=5). Both related and unrelated donors were used, including bone marrow, cord blood, and peripheral blood stem cell sources. The majority of patients received FTBI/cyclophosphamide or FTBI/etoposide conditioning. Kaplan-Meier curves were generated to evaluate overall survival (OS)and relapse free survival (RFS) based on era of treatment, diagnosis, donor source, and disease status at time of transplant.
Results: Significant improvement in early outcomes at 1 and 3 years was noted for patients who were treated over the last decade regardless of diagnosis or disease status at the time of transplant. One and 5 year overall survival for ALL improved from 57% and 46% prior to 2001 to 92% and 74% since 2006. The best long term survival (69% at 5 years) was observed for ALL in first complete remission (CR1). Five year OS decreased incrementally for patients in CR2 (59%) and CR3+ (34%). Interestingly 5 year OS in ALL was greater in patients who received an unrelated donor (URD) transplant for ALL (67%) as compared to those who had a sibling donor (51%).
Conclusions: The improved outcomes seen in pediatric and AYA patients transplanted for leukemia indicate the beneficial effects of improved supportive care, earlier use of SCT in high risk patients, and improved identification of alternate donors (URD). Importantly, patients with ALL had higher early and long-term overall and relapse-free survival, with better outcomes for patients transplanted in CR1. The data presented demonstrate that HSCT can be beneficial and should be considered, even for patients with advanced disease. The improved overall and relapse free survival in our

unrelated donor HSCT ALL patients supports a graft vs leukemia effect translating into better outcomes.

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Alemtuzumab As Therapy for Mixed Chimerism After Hematopoietic Stem Cell Transplantation for Fanconi Anemia (FA)

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Background: The development of mixed chimerism/graft rejection is not uncommon following transplant for FA. A proportion of children with FA demonstrate somatic mosaicism, carrying two populations of lymphocytes, one with a true DEB sensitive phenotype, and a second population of lymphocytes with a DEB resistant phenotype, often arising from a somatic gene conversion event in compound heterozygous cells, generating a single normal FA allele. Preparative regimens for FA transplants are typically dose-reduced to accommodate the increased toxicity associated with the FA phenotype, and while sufficient to clear lymphocytes with an FA phenotype, may not be adequate for revertant or mosaic lymphocytes with a revertant or mosaic phenotype. We describe a series of three children with FA who received Alemtuzumab for treatment of mixed chimerism associated with an abrupt rise in their absolute lymphocyte count (ALC), likely due to expansion of host lymphocyte populations with a DEB resistant mosaic phenotype.

Methods: Patients, donor and transplant characteristics are shown in Table 1. Conditioning regimen included busulfan 0.8-1.0 mg/kg/dose Q 12hrs (with pharmacokinetic monitoring) x 4 doses, fludarabine 35 mg/m2/dose, cyclophosphamide 10 mg/Kg/dose, and ATG 2.5 mg/kg/dose once daily x 4 doses.

Results: After initial complete engraftment, each child displayed an acute elevation of their ALC at 50, 50 and 36 days after transplant, concurrent with a rapid decline in donor chimerism (see Table 1). Patients received alemtuzumab 0.8 – 1.0 mg/kg over the course of 3-5 days, resulting in expected lymphopenia which corresponded with improving donor chimerism by the end of the first week of therapy. First 2 patients have continued to have full donor chimerism (>99% donor) for > 3 months. Patient # 3 although showed improving chimerism (up to 81.4%), did not recover from secondary graft failure and went on to receive second transplant from a 6/8 HLA matched parent donor. After initial engraftment of 100%, she again had an acute

Table 1
Patient, Donor and Transplant Characteristics and Results

Patient characteristics										
Age range (years)		8 to 13								
Donor characteristics										
Patient 1		MURD (7/8)								
Patient 2		MURD (8/8)								
Patient 3										
Transplant # 1		MSD (7/8)								
Transplant # 2		MMRD (6/8 parent)								
Transplant characteristics										
Graft		T-cell depleted, CD34 selected PBSC graft, using a Miltenyi Clini MACS device								
GVHD prophylaxis		CSA								
Results										
Patient 1	Day + 9	Day + 14	Day + 30	Day + 50	Day + 51	Day + 52	Day + 53	Day + 54	Day + 55	Day + 59
ALC		110	470	**2180**	870	190	**70**	110	0	
Donor chimerism %		100	100	**65**	82	100	**100**	100	100	
Alemtuzumab				↑	↑	↑	↑	↑		
Patient 2										
ALC	570	860	540	**4000**	1690	580	350	250	**80**	210
Donor chimerism %	99.6	98	97	**69**	73	79	91	94	**99**	100
Alemtuzumab				↑	↑	↑	↑			
Patient 3	Day + 12	Day + 19	Day + 30	Day + 36	Day + 40	Day + 43	Day + 50			
Transplant #1 ALC	0	60	100	**980**	870					
Donor chimerism %	100	99.2	98.8	**62.8**	32.6	53.1	81.4			
Alemtuzumab				↑						
	Day + 9	Day + 14	Day + 16	Day + 17	Day + 18	Day + 19	Day + 23			
Transplant #2 ALC	10	50	**1260**	1260	530	260	**0**			
Donor chimerism %	100	98	**85**	89	96	99	**100**			
Alemtuzumab			↑	↑	↑					